

Inequality of Educational Opportunity in East and West Germany: Convergence or Continued Differences^{*}

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Abstract

Diversity in education systems, and broader political and economic conditions, are commonly credited with international variations in inequality of educational opportunity (IEO). Comparing East and West Germany before reunification allows us to investigate whether vastly different political, economic and educational systems led to differences in IEO. Post-reunification, East Germany adopted the West's systems and experienced an economic recession. IEO had been smaller in East than in West Germany but was on an upward trajectory before reunification. After 1990, IEO in East Germany converged to the West German level as a result of decreased IEO in the West and increasing levels in the East. Post-reunification convergence suggests differences in political context and education policy are crucial for IEO.

Keywords

Social Stratification; Educational Inequality; Education Policy; Comparative Research; Educational Reforms; Education Systems; German Reunification

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INTRODUCTION

There are substantial differences in the degree of social inequality in educational opportunity (IEO) between countries (Blossfeld et al. 2016; Blossfeld and Shavit 1993; Breen et al. 2009; Pfeffer 2008). These differences are linked to institutional features within national education systems like early segregation into different educational tracks, and level of standardization in curriculum, assessment and schooling (see: Bol et al. 2014; Brunello and Checchi 2007; Chmielewski and Reardon 2016; Hanushek and Wößmann 2006; Horn 2009; Pfeffer 2015). The more ‘stratified’ and less ‘standardized’ the education system in regard to school-leaving examinations, teachers’ training, school budgets and curricula, the larger the IEO (Van de Werfhorst and Mijs 2010).

IEO by social origin may also vary according to macro-level political, socio-economic and cultural conditions facing students and their parents. According to the liberal theory of industrialism (Kerr et al. 1973; Treiman 1970), as economic development and technical progress require a more efficient use of talent, free-market economies inevitably develop towards selection based on merit. In contrast, Bukodi and Goldthorpe (2010) argue that free-market economies are incompatible with an education-based meritocracy because individuals of higher social backgrounds can convert parental resources into educational advancements. They argue that policies employed by former socialist states to promote the educational attainment of children from working-class families may be regarded as the “most fully developed form of meritocracy, of an education-based kind” (Bukodi and Goldthorpe, 2010: 656).

In this study, we exploited the division and later reunification of Germany into the Federal Republic of Germany (FRG), a Western free-market economy, and the socialist German Democratic Republic (GDR), to investigate the impact of these different political systems and the associated institutional and socio-economic context on the degree of IEO.

Survey data from multiple sources allowed us to compare IEO in East Germany before and after reunification with a “baseline” in West Germany. Our primary focus was on differences in IEO between East and West Germany and whether the adoption of the West German political education system led to a convergence of IEO after reunification. We also studied educational attainment rates of those whose parents did and did not attain *Abitur* separately to gain insights into the processes that underlie the trends in overall IEO-levels.

Although there is a comprehensive body of literature on trends in IEO in West Germany (Blossfeld 1993; Heineck and Riphahn 2009; Henz and Maas 1995; Jonsson, Mills, and Müller 1996; Klein et al. 2010; Meulemann 1992; Müller and Pollak 2007; Schimpl-Neimanns 2000), few studies compare IEO between East and West Germany prior to (Hadjar and Berger 2010; Sieben, Huinink, and Graaf 2001), or after, reunification (Riphahn and Trübswetter 2011). Sieben et al. (2001) reported that IEO declined over time in both the FRG and the GDR. Hadjar and Berger (2010) also found a decline in IEO throughout this period under the GDR (except for an increase for birth cohorts 1955-1964) and showed that IEO-levels were less significant in the GDR than the FRG. In the period following reunification, Riphahn and Trübswetter (2011) found that social inequalities in educational attainment in East Germany rose, with IEO growing higher in East than in West Germany at the beginning of the 2000s. This result is consistent with studies on other post-socialist societies, which reported that IEO grew after transition to market economies (Beblo and Lauer 2004; Bukodi and Goldthorpe 2010; Gerber 2000; Hazans, Trapeznikova, and Rastrigina 2008; Hertz, Meurs, and Selcuk 2009; Mateju, Rehakova, and Simonova 2003; Varga 2006), especially in those Central and Eastern European countries which followed the West German example and reinstalled early school tracking (Kogan, Gebel and Noelke, 2012). Von Below, Powell, and Roberts (2013) further showed that state education systems which adopted a highly-stratified system with a more ‘traditional’ curriculum (e.g. emphasis of classic and humanist subjects,

centralized final exams) from West German states experienced higher IEO than those which did not.

The only study comparing IEO in East and West Germany before and after reunification, Kesler (2003: 474) found that “the GDR in its final years was no more successful than the advanced capitalist FRG in promoting the *Abitur* attainment of working-class children”. Contrary to other studies on transition states, she identified stability in IEO after reunification and, if anything, a decline in East Germany. However, this study was restricted to school-leaver cohorts in the early 1980s in the period immediately after reunification and, most importantly, involved rather small sample sizes, especially for post-reunification cohorts.

Our study contributes to the existing literature by describing the development of IEO in both East and West Germany across birth cohorts from 1930 until several years after the reunification. To this end, we used all available micro-data for this period that we deemed suitable: the German Life History Study (GLHS), the German General Social Survey (GGSS), and the German Microcensus (GMC). The GMC data also enabled us to investigate variation in the development of IEO across East German federal states, which may shed further light on how differences in educational systems affect IEO.

THEORETICAL BACKGROUND: PRIMARY AND SECONDARY EFFECTS

Our study is rooted in Boudon’s (1974) concept of primary and secondary effects of social stratification. The primary effects capture the association between social class origin and school performance, while the secondary effects quantify the impact of social class origin on educational choices (e.g. whether to attend upper secondary education).

Rational choice models that explain why secondary effects emerge assume students and their parents evaluate the ‘costs’ and ‘benefits’ of attending a certain educational track along with the likelihood that the track will be completed (Boudon 1974; Breen and

Goldthorpe 1997; Erikson and Jonsson 1996). Costs include monetary expenditures (e.g., school fees) and forgone earnings due to postponing of entering the labor market. Status maintenance motive, families' assessments of whether the student's education and subsequent occupation enables the family to preserve its social class position, is a core element of this theory. Some models also assume families' evaluation of the 'benefits' include social and cultural benefits namely attending the same school as peers or enjoying general education (Boudon 1974, Erikson and Jonsson 1996).

Three mechanisms of this decision-making process generate secondary effects. Firstly, social class differences in students' average school performance (i.e., the primary effects) shape families' evaluation of whether the student will successfully conclude a certain track. Secondly, social class differences in families' economic resources influence their evaluation of ability to bear the costs of the student's attending a certain track. Thirdly, to maintain their family's social position, students of higher social class origin require attendance at higher educational tracks than students of lower social class origin. Jackson and Jonsson (2013) found that countries differ more strongly in the extent of secondary effects than they differ in the magnitude of primary effects, suggesting education policy and the institutional setting play a more substantial role in shaping secondary effects rather than they do in primary effects.

In the following, we connect these mechanisms on the micro-level to macro-level differences between East and West Germany in the education system, socio-political culture, and economic conditions from the end of World War II until the 21st Century. On this basis, we extrapolate competing hypotheses about the development of IEO in both parts of Germany over time.

A COMPARATIVE VIEW OF EAST AND WEST GERMANY OVER TIME

Education Policy

The West German educational system typically sorts children at a very early stage (aged around 10 or 12, depending on the federal state) into *Hauptschule* (lower secondary track), *Realschule* (intermediate secondary track) and *Gymnasium* (upper secondary track). Customarily, the *Gymnasium* has been the only track that has given students eligibility to enter higher education via the certificate of the *Abitur*. Student mobility between these school tracks is rare (Mühlenweg 2008; Schneider 2008). In the 1970s, some federal states introduced *Gesamtschulen* in which the three different tracks run in parallel inside one institution and students can remain together while achieving different final certificates.¹ Over time there have been extensions of non-standard pathways to the *Abitur* and the introduction of different types of *Abitur* at vocationally-oriented schools, such as those that allow access to polytechnics or specific fields of study. These non-standard pathways facilitated the achievement of eligibility to higher education in recent periods (e.g. Köller, Watermann, and Trautwein 2004; Schindler 2014).

There are differences in how students are tracked in different German federal states. For example, in some states, parents can decide on their child's secondary school track, while in other states teacher evaluation and strict requirements, such as minimum grade-levels, are decisive. Some federal states also combine *Hauptschule* and *Realschule* into one school type. The age when students make the transition to secondary school also varies between states. In many states, the transition is at age 10 or has been changed from age 12 to age 10 in the 1950s; in other states, the age is 12. Appendix Table 1 provides an overview of institutional differences across West German federal states.

In West Germany, vocational schools and business firms coordinate training that equips students with highly occupation-specific skills rather than general knowledge through classroom and in-work education (Müller, Steinmann, and Ell 1998). These apprenticeships provide a ‘safety net’ against unemployment or employment into low-skilled positions (Arum

and Shavit 1995). Today, around one-third of *Abitur*-holders participate in the vocational training system instead of entering higher education (Heine, Spangenberg, and Lörz 2007).

Given these institutional arrangements (early tracking, low permeability between tracks, an attractive dual system of apprenticeship), IEO in West Germany is unusually high by international standards (Breen et al. 2009; Pfeffer 2008). While some studies found persistent social inequalities in educational attainment over time (Blossfeld 1993; Heineck and Riphahn 2009; Meulemann 1992), others showed that IEO has decreased across birth cohorts in West Germany (Henz and Maas 1995; Jonsson et al. 1996; Klein et al. 2010; Müller and Haun 1994; Müller and Pollak 2007; Schimpl-Neimanns 2000).

Under the GDR, the education system was less stratified than in West Germany. The Socialist Unity Party of Germany (SED) implemented policies centrally throughout the GDR's existence, and the education ministry of the central state administered a homogenous education system. From 1950 onwards, all students attended a comprehensive school, the *Polytechnische Oberschule (POS)* (Von Below 2009), for ten years, where low-achieving students experienced significant support and high-performing students received considerably less (Von Below 2009).

After compulsory school at Grade 8, the education system offered the opportunity to change from POS to the *Erweiterte Oberschule (EOS)*. The EOS led to a certificate of *Abitur*, allowing entry into university, and almost every student who obtained the *Abitur* successfully enrolled. After 1983, the transition to EOS happened after grade 10 (Winkler 2017: 109). Access to the EOS was strictly regulated, restricted and based on prior achievement and, especially between 1945 and 1965, on the social class and political engagement of parents (Baske 1990: 214; Von Below 2009). Children of industrial and agricultural workers were prioritized, in line with socialist doctrine.

After completion of the POS, students were also able to opt for an apprenticeship or training in a vocational college, the latter mostly for social, pedagogical or artistic jobs. Unlike in West Germany, vocational schools were established within state production units, indicating strict state regulated access to, and allocation within, the vocational system in the GDR.

The ‘positive discrimination’ of worker children was sharply reduced from the mid-1960s. Those who had benefited from this process, the socialist intelligentsia who had been the first school leaver cohorts to spend their entire education under the GDR, wanted their children to be equally successful (Von Below 2009; Brock 2009).² High-performing students with no personal or parental affiliation with the SED and those who exhibited limited socialist attitudes and behaviors had minimal chances of accessing the EOS (Von Below 2009; Fischer 1992). Simultaneously, the link between parents’ education and SED membership and governmental or administrative positions was marked (Fuller 1999: 21). In the early 1970s, the GDR halted university expansion and reduced the number of studentships.

Two principal arguments predicting larger IEO in the FRG than in the GDR emerge from our discussion of the institutional and political contexts in East and West Germany before reunification. According to the ‘market versus meritocracy’ argument (Bukodi and Goldthorpe 2010), intergenerational social reproduction will always be a considerable factor in free-market economies, as privileged students profit from their upbringing with higher abilities and resources. Bukodi and Goldthorpe (2010) further argue that command economies like the GDR come closer to an educationally meritocratic ideal because they explicitly intervene against intergenerational reproduction by imposing meritocracy and explicit policies to reduce inequalities. Therefore, it is reasonable to expect social inequalities to be more significant in a ‘choice-based system’ such as the FRG than in an ‘imposed’

system based on academic achievement and limited choice of educational pathways like the GDR (Kesler 2003: 470). As the GDR abandoned some policies tackling intergenerational reproduction of social inequality after 1965 (e.g. Brock 2009), we can reasonably assume IEO increased from this point onwards.

Secondly, the FRG's highly selective early tracking system, in contrast to the GDR's comprehensive school system, would suggest a considerably larger IEO. Since the transition to upper secondary school occurred later in the GDR than in the FRG, (lower class) students in the East had more time to develop their full potential before being segregated into different educational tracks (Erikson and Jonsson 1996; Müller and Karle 1993). Additionally, primary effects were likely to be more potent in the FRG as earlier segregation into a lower school track meant students from lower socio-economic backgrounds had less time to benefit from the presence of more able and motivated students before segregation (Lavrijsen and Nicaise 2016). Different school tracks may also differ in curricula quality, teacher ability, expectations and educational or financial resources. Overall, early tracking systems were shown to reinforce the gap in academic achievement between social groups and increase the primary effects when compared to comprehensive systems (Burger 2016; Hanushek and Wößmann 2006; Horn 2009; Schütz, Ursprung, and Wößmann 2008).

We assume secondary effects to be smaller in comprehensive school systems (GDR) than in selective school systems (FRG). When students are allocated to different tracks at an early age, it is more difficult for them to assess their ability or 'likelihood of success' than when they are older, as available information to them at these early transition points is limited (Jackson and Jonsson 2013). Students are less dependent on their parents – economically and socially – during later transitions, and parents' characteristics should, therefore, matter less in students' educational decision-making (Müller and Karle 1993). In an experimental design, late tracking has been shown to decrease secondary effects and thus IEO by reducing

uncertainty in educational-decision making for lower class students (Berger and Combet 2017). Overall, comprehensive school reforms in other countries led to a reduction in social inequalities in educational attainment (Erikson 1996; McPherson and Willms 1987).

Within early tracking systems, the extent of secondary effects also depends on the process of selection. Dollmann (2016) finds that social inequalities in school track choices are less significant in German states where teacher recommendations are binding than those where they are non-binding and parents make the final decision. This illustrates that higher-class students benefit from educational systems that offer choices.

Hypothesis 1 (political and educational system hypothesis) is as follows: The association between social origin and the attainment of the *Abitur* was weaker in the GDR than in the FRG. We expect the number of children from a lower social origin achieving *Abitur* was comparatively high during times of positive discrimination (until the mid-1960s) in the GDR and decreased after it ended. As the GDR reduced positive discrimination from the mid-1960s onwards, we hypothesize that IEO slightly increased. Nevertheless, we expect that IEO always remained at a lower level than in the FRG. Since the tracking decision was shifted to a later point in time, IEO may have also lessened somewhat again from 1984.

After reunification, the two features designed to reduce IEO in the GDR – positive discrimination and comprehensive schooling – were replaced with a tracked educational system adopted from West Germany along with a free-market economy. Newly established federal states in East Germany were assigned partner states in the West, from which the majority adopted the education systems for the states they now had authority over (von Below et al. 2013; Goedicke 2006). For an overview of institutional changes in each East German state after reunification and until the year 2004 – the year until birth cohorts are affected by institutional changes in our analysis – see Appendix Table A2.

The abolition of ‘positive discrimination’ and the expansion of upper secondary education should have led to an increase in IEO post-reunification due to an increase in both primary and secondary effects via families’ status maintenance motives and class-specific cost-benefit-calculations. As students of higher social origin were freer to transform higher abilities and parental resources into educational advantage, we expect considerably higher rates of *Abitur* among more advantaged children post-reunification. In contrast, “protected routes to upward mobility for children of lower-class origin are taken away” (Jackson and Evans 2017: 59) and this should have led to a limited uptake of *Abitur* among lower-class children post-reunification.

The introduction of West Germany's model created more stratification in the education systems of Eastern states than there had previously been. In Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt, Mecklenburg-Vorpommern and Thüringen the age of students being segregated into different tracks was lowered from 16 to ten years-of-age. In Berlin (East) and Brandenburg, the age of tracking was lowered to 12 years-of-age (Freitag and Schlicht 2009; see Appendix Table 2).

Furthermore, the decision-making process used for transition to secondary schooling varied with reunification. While schools and the state had strictly regulated this process under the GDR, some new federal states adopted a system in which parents made the final decision (Berlin (East), Brandenburg, Mecklenburg-Vorpommern, Sachsen-Anhalt) and others adopted a model in which teachers decided (Sachsen, Thüringen).

Thirdly, federal states differed in the implementation of the West German tripartite school system after reunification. Only Berlin (East), Brandenburg and Mecklenburg-Vorpommern introduced all three different school tracks. Sachsen, Sachsen-Anhalt and Thüringen distinguished only between *Gymnasium* and a combination of the lower tracks. Hence federal states differed in the degree of tracking during our observation period.

Hence, in most East German states students and their parents had to personally decide whether to attempt the *Abitur*, and this decision was now made earlier in the child's life across all Eastern states. Early tracking made accurate parental assessment of their children's likelihood of success more difficult – one of the core factors in educational decision-making processes – and consequently fostered strong secondary effects. Furthermore, as parental involvement in school and home learning became more valuable than it had been under the GDR (Goedicke 2006), increased primary effects and IEO can be assumed. We expect that this would become apparent in strongly increasing rates of *Abitur* attainment among higher class children. It is therefore reasonable to expect IEO to have sharply increased post-reunification. Secondary effects are assumed to be further reinforced in states where parents and students had the central decision-making power (Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen-Anhalt).

Hypothesis 2a (systemic change hypothesis) suggests that after reunification social inequalities in the attainment of the *Abitur* increased in East Germany and converged to a similar level of the West. See Figure 1a for an illustration of the 'idealized' IEO trends that is the trends that would be observed if institutional changes were the only factor influencing IEO.

According to our theoretical assumptions, IEO should have increased to a higher degree in East German states in which the tracking degree was most pronounced, i.e. students are selected into three different school tracks, parents decide on the school track and tracking happens at aged ten rather than 12 (see Appendix Table A2). Table 1 shows how changes in all three factors should impact social inequalities in educational attainment in our observation period. '++' should lead to more pronounced social inequality, '+' should also lead to increasing inequality but to a lesser extent. From this, we can conclude the strongest increase in IEO should be observed in Mecklenburg-Vorpommern due to high level of tracking;

tracking decisions being made at ten years-of-age and parents decided on their children's school track. Brandenburg, Sachsen-Anhalt and Berlin (East) are in an intermediate position. According to this table, we can expect the smallest increase in IEO in Sachsen and in Thüringen. These assumptions will be tested in our state-specific analysis.

Table 1 here

Economic conditions

In the GDR unemployment was practically nonexistent. After reunification, West German economic institutions were quickly installed in the East (Diewald, Solga, and Goedicke 2002; Gebel 2011; Kaser 1998; Mayer 2006). From the end of 1989 to mid-1992, the East's economic system experienced extensive restructuring involving the closing of the majority of large state-led companies, downsizing of firms and the emergence of numerous business start-ups. This restructuring led to severe labor market turbulence resulting in direct firm shifts and upward and downward mobility (Diewald et al. 2002). Unemployment had already risen from 0 to 3.1 percent by the mid-1990s (Diewald et al. 2002) and, eventually, to 16 percent. From mid-1992 East Germany experienced a time of economic stagnation (Mickler et al. 1996).

The drastic changes in the economic system also affected the vocational training system (Gebel 2011). The economic downturn meant enterprises were unable to afford apprentice positions, compelling their increase in state-subsidized external training facilities (e.g. Grünert, Lutz, and Wiekert 2006). The GDR's birth policies in the 1970s led to a rise in the number of school leavers from the mid-1990s onwards, so the few available apprenticeship positions were quickly filled (Troltsch, Walden, and Zopf 2009). Young people with vocational qualifications experienced increasing difficulties in finding a job (Gebel 2011).

According to the "discouraged worker effect", poor labor market conditions, such as unemployment and low wages, influence students' decisions to remain in school beyond compulsory education (e.g. Meschi, Swaffield, and Vignoles 2011; Micklewright, Pearson, and Smith 1990; Raffe and Willms 1989). Poor economic conditions suggest to students that benefits from entering the labor market, and therefore costs of schooling, are low. Consequently, staying in school to attain the *Abitur*, instead of attending vocational education or dropping out, may have been an increasingly popular option in East Germany immediately after reunification.

It can be argued that these poor labor market conditions contributed to an increase of secondary effects because the cost-parameter in the decision-making equation became increasingly relevant. Despite a rise in overall wages, the transformation from a command economy to a free-market economy in East Germany led to the perception of rising income inequalities (Frick et al. 1995; Headey, Andorka, and Krause 1995) and increasing disparity between families' resources. As some families' resources became increasingly constrained, for example through parental unemployment, students of those less advantaged backgrounds may increasingly have chosen the less costly and shorter vocationally-oriented tracks or entered the labor market directly in order to provide financial support to their families.

Students of higher social origin may have been more inclined to continue with education because their parents were more aware of the economic consequences of reunification, such as decreasing employment opportunities, declining social mobility, and problems in the vocational training system. In several experimental designs, an information deficit of students from lower social backgrounds has been identified as decisive in choosing lower educational tracks (Barone et al. 2017; Ehlert et al. 2017; Oreopoulos and Dunn 2013). Higher-class parents may also have had more knowledge about the strong links between education and occupational attainment in West Germany.

Employers increased hiring standards and the sorting of job applicants by their educational qualifications during the economic downturn (e.g. Wolbers, De Graaf, and Ultee 2001). This process could have increased the risk aversion of families' educational decision-making: students from higher social background felt more pressure to invest in education under adverse macroeconomic conditions to preserve social status. Those families who had been relatively well off at the time of reunification were those who felt the most dissatisfied with their incomes in the years after reunification (Headey et al. 1995). This also seems to indicate that higher status families were particularly worried about maintaining their status. Figure 1b illustrates that if these economic developments were the sole or strongest factor influencing IEO, a sharp increase in IEO between 1989 and 1992 should be observed.

Hypothesis 2b (economic shock hypothesis) suggests that due to the short period of economic shock, social inequalities in East Germany strongly increased immediately after reunification and later adjusted to the level of West-Germany.

Cultural differences

The SED aimed to develop people with ardent socialist convictions to form the bedrock of the socialist society (Brock 2009) and formulated school civics lessons for this purpose (Blessing, Grammes, and Schluss 2012; Kreutzer 2001; Kuhn, Massing, and Skuhr 1993). Between 1949 and 1961 the socialist school was established to promote attachment to the new socialist state and taught socialist 'doctrine' such as the convergence of societal interests and personal interests. In addition to this socialist education, there was little opportunity for the use of status symbols as the availability of many consumer goods was restricted.

By the mid-1970s it was proclaimed that East Germans had developed their sought-after socialist personalities (Brock 2009). However, due to growing wealth differences between socialist and capitalist states, the influence of family and peers, and awareness of

conditions in the West (e.g. through Western TV and family ties), students became increasingly critical of civics lessons. Therefore, shaping students into model socialist personalities became more difficult (Blessing, Grammes and Schluss 2012; Brock 2009). Young people's occupational aspirations were not in line with the 'economic requirements' of the socialist system; the workforce was only recruited where it was needed, leading to frustration among young people (Brock 2009).

Nevertheless, the 'socialization hypothesis', which explores East-West differences in attitudes towards inequality and the role of the welfare state (e.g. Kaase and Bauer-Kaase 1998; see also Liebig and Verwiebe 2000 for a more differentiated view), assumes growing up under the GDR's education system has long-term effects on people's attitudes and world-views. Assuming that socialist education had successfully internalized collective goals, such as a society free from class hierarchies and reproduction, it could be expected that status maintenance motives were less at play in educational decision making. Higher class parents were less interested in making sure that their children attain the same status as themselves because status was less valued or performed in the socialist GDR. This should have led to lower rates of *Abitur*-holders among children of higher social origin in the GDR as compared to the FRG, as well as lower IEO. The emphasis on inclusive education within socialist ideology may have had a lasting impact on individual preferences concerning the role of the state (Alesina and Fuchs-Schündeln 2007) and egalitarianism or rejection of ascriptivism (Wegener and Liebig 1995), contributing to continuously weaker levels of IEO post-reunification.

Overall, it can be expected that the teaching of socialist values in the GDR led to lower levels of IEO until the mid-1970s. After this, with young people becoming more aware of increasing wealth in the West and having more critical attitudes towards the socialist system, IEO can be expected to have slightly risen through growing rates of higher class

children opting for *Abitur* attainment. Nevertheless, growing up in the GDR should have had lasting effects on preferences and IEO therefore remained lower than in West Germany for a more extended period after reunification. As parents and children have spent less and less time living in the GDR, the influence of ‘socialist socialization’ may have become weaker, and IEO in the East should have eventually increased over time. Figure 1c shows the IEO trend that could be observed if these were the only developments at work.

Therefore, *hypothesis 2c (socialization hypothesis)* claims that the association between social origin and *Abitur* attainment remains weaker in East Germany than in the West post-reunification, and in the long run should have slowly converged to the West German level.

Figure 1 here

METHOD

Data

To describe the long-term development of IEO in East and West Germany we use a variety of German micro data. The German Life History Study (GLHS) is ideal for identifying differences in IEO between the FRG and the GDR for the birth cohorts who finished school before reunification (Mayer 2008). The German General Social Survey (GGSS) allows us to compare changes in IEO in East and West Germany before and after reunification. The German Microcensus (GMC) is valuable for studying IEO at the time of reunification and thereafter until the most recent school-leaver cohorts and, because of relatively large sample size, for assessing development at the level of the (Eastern) federal states. The GLHS only selected German citizens into their sample. Our sample therefore excludes non-German citizens to achieve comparability of samples across the observation period.

Figure 2 gives an overview of the birth cohorts included in our different datasets. The vertical dashed grey line in this figure indicates the crucial timing of reunification for birth

cohorts' educational decision-making. All East German birth cohorts on the left of this line (until 1973) were selected into upper secondary education before reunification. All Eastern German birth cohorts on the right of this line (starting from 1974) were segregated after reunification.

Figure 2 here

The GLHS provides retrospective information on several nationally representative birth cohorts, with the oldest cohort born in 1919 and the youngest cohort in 1971. These surveys were carried out in face-to-face interviews and computer-assisted telephone interviews between 1981 and 2005. The GLHS includes survey information on life histories for more than 12,000 respondents. For West German residents, retrospective information on the following seven birth cohorts will be used: 1929-1931, 1939-1941, 1949-1951, 1954-1956, 1959-1961, 1964 and 1971 (Mayer 1995a; 1995b; Mayer and Kleinhenz 2004). For East German residents, data on five birth cohorts is available: 1929-1931, 1939-1941, 1951-1953, 1959-1961 and 1971 (Mayer 1995c; 2004). Due to the retrospective nature of the study, we use information on educational attainment from all respondents in the different birth cohorts at the time of the survey. The total number of cases is 6,536 for West Germany and 2,819 for East Germany (see Table A3 for the number of cases in each cohort and each part of Germany).

The GGSS is a biannual cross-sectional face-to-face survey of the adult population of Germany from 1980 onwards. After reunification, an additional survey was conducted in 1991. In our analysis, we used the waves 1991-2016 which include information on East German residents (GESIS - Leibniz Institute for the Social Sciences 2016; 2017). We restrict the respondents to those 22-40 years-of-age at the time of the survey to include most of the individuals that completed upper secondary schooling and to ensure that birth cohorts do not vastly differ in age. Schooling in East and West Germany is identified by residence at the

time, supplemented by information on place of residence at birth, or in adolescence for respondents born before 1990. The total number of cases is 7,454 for West Germany and 4,208 for East Germany (see Table A4 for the number of cases in each cohort and each part of Germany).

The GMC is a representative survey of the German population covering one percent of all German households. It has been conducted annually in West Germany since 1957 and in East Germany from 1991. We will use the following de-facto anonymized Scientific-Use-Files (SUF) which are 70 percent subsamples of the original sample: 1991, 1993, 1995 and annual information for the years 1996-2010. Since the GMC does not explicitly ask respondents about their social background, we use the contextual information on households to generate information on parental education. We follow the procedure by Klein et al. (2010) and restrict our analysis on 18-year-olds that live with their parents.³ Based on these data, we cover cohorts born between 1973 and 1992, thus including one cohort (1973) that was segregated into secondary school tracks prior to reunification and a long observation period of cohorts that entered secondary school tracks post-reunification. The total number of cases is 61,864 for West and 16,757 for East Germany (see Table A5 for the number of cases in each cohort and each part of Germany).

Measures

Our measurement of IEO is a binary variable indicating whether individuals attained or did not attain the *Abitur*. Social inequalities in *Abitur* attainment are crucial because the *Abitur* is not only a prerequisite for gaining access to higher education and, in turn, for better labor market returns, but is increasingly demanded to gain access to the most prestigious apprenticeships.

The dependent variable in the GMC data deviates from the other data sources in two respects. Firstly, we look at participation rates of 18-year-olds in upper secondary education

(*Gymnasium*, grade 11-13).⁴ Secondly, participation rates are restricted to the general *Gymnasium* and do not cover the technically oriented *Gymnasium*⁵ and delayed *Abitur* attainment in later life. Hence, measurement of *Abitur* attainment is not strictly comparable across data but should be internally consistent across birth cohorts within data.

Our independent variable of social origin is measured by father's education. In case we do not have information on father's education, we use mother's education. We differentiate between pupils who have a father (mother) with *Abitur* and pupils who have a father (mother) with a qualification below the *Abitur*. We believe that the extent of educational reproduction is a reasonable measure for IEO in the context of the GDR and the transition to a market economy after reunification.

Analysis

We use the difference in *Abitur* attainment rates by parental education as our measure of IEO. To calculate this difference, we rely on a fully interacted logistic regression model of *Abitur* attainment on parental education, birth cohort, and region. For ease of interpretation, we also provide estimates for the difference in IEO by region. In the final analysis, using GMC data and aggregated birth cohorts, we provide estimates for East German federal states with similar tracking arrangements separately (see Table A6 for the number of cases in each cohort).

RESULTS

General Abitur rates

Figure 3 illustrates trends in the *Abitur* rates across birth cohorts in East and West Germany in all three datasets along with the 90% and 95% confidence intervals. Based on GLHS data, the upper left graph shows that in the early stages of the GDR (cohorts 1929-1931 and 1939-41) the percentage of individuals attaining the *Abitur* did not significantly differ from the *Abitur* rate in the FRG. Both in the FRG and the GDR *Abitur* rates increased

from birth cohort 1939-41 onwards at a similar rate until cohorts born around 1950. While *Abitur* rates continued to increase among 1950s birth cohorts in the FRG, we saw a decrease in the percentage of individuals attaining the *Abitur* in the GDR. This significant divergence in *Abitur* rates between the FRG and the GDR is evident in the GLHS data and the GGSS data (upper right graph). For cohorts that were channeled into the *Abitur* track before reunification, this gap tends to be more pronounced in GGSS data (almost 20 percentage points) than in GLHS data.

Figure 3 here

The *Abitur* rate rose more strongly in East Germany than in West Germany among cohorts that transitioned into different school tracks after reunification and, as a consequence, *Abitur* rates converged, as evidenced in both GGSS and GMC data. *Abitur* rates in both parts of Germany ran in parallel for cohorts born at the end of the 1970s onwards; however, the percentage of students attaining the *Abitur* (GGSS) or attending the *Gymnasium* (GMC) in East Germany has consistently remained slightly below the West German level. Overall, we find clear evidence that the percentage of individuals with *Abitur* converged post-reunification.

Social inequalities in Abitur rates

Figures 4 to 6 show IEO across birth cohorts for GLHS, GGSS, and GMC data. For both West and East Germany, the left-hand graphs illustrate trends in *Abitur* rates across birth cohorts for children who have at least one parent with an *Abitur* and those who do not. The upper right-hand graphs illustrate risk differences between children whose parents are *Abitur*-holders and those who are not. The lower right-hand graph shows the relative percentage of risk differences between East and West Germany along with 90% and 95% confidence intervals.

The GLHS data in Figure 4 covers birth cohorts in the FRG and the GDR that transitioned into upper secondary school tracks before reunification. Among the oldest cohorts (1929-1931 and 1939-41), the percentage who have non-*Abitur*-holding parents but go on to hold *Abitur* themselves is small and similar across both the FRG and the GDR. For cohorts born in the 1940s, this number increased in both states. The percentage of students whose parents are not *Abitur*-holders going on to attain *Abitur* continued to rise in the FRG but stagnated in the GDR for cohorts born from the 1950s onwards; they, therefore, had a higher probability of attaining the *Abitur* in the FRG.

Figure 4 here

Students with *Abitur*-holding parents were far more likely to attain *Abitur* in the FRG than in the GDR among the oldest birth cohorts (1929-1931 and 1939-41). In the FRG *Abitur* attainment rates rose steeply for this group among 1940s and 1950s birth cohorts. This expansion hit a ceiling with 1960s birth cohorts, and it was less advantaged students who began experiencing an uptick in *Abitur* attainment. In the GDR, *Abitur* rates among individuals who had at least one parent with *Abitur* mirrored the general GDR rate and growth. If opportunities were more pronounced or more restricted, it was primarily these individuals who used these widened opportunities to attain the *Abitur* or were held back. As a consequence, the FRG-GDR gap between these advantaged children attaining *Abitur* narrows for cohorts born in the 1940s, widens sharply for 1950s birth cohorts, and narrows again for cohorts entering the secondary school track before reunification.

As a result of these group differences, IEO (upper right-hand graph) was far higher in the FRG than in the GDR for the oldest birth cohorts. As a consequence of expanded *Abitur* rates among those from the 1940s birth cohorts with *Abitur*-holding parents, IEO increased in both states. For cohorts born in the 1950s, IEO decreased in the GDR and remained stable in the FRG, leading to the most significant gap in IEO between the two during our observation

period. Again, this can be attributed to decreasing levels of *Abitur* attainment in the GDR amongst those whose parents are also *Abitur*-holders. For cohorts born in the 1960s (i.e. individuals segregated into the upper secondary school track in the 1970s), levels of inequality became similar in the FRG and the GDR due to increased IEO in the GDR and decreased IEO in the FRG.

We can also identify social inequalities in *Abitur* attainment rates in the GGSS data for cohorts born in the 1950s and later (Figure 5). The GGSS data reveal a similar pattern as the GLHS data for cohorts born between 1950 and those segregated into the secondary school track immediately before reunification. Firstly, *Abitur* attainment rates for individuals with *Abitur*-holding parents in the GDR decreased in the 1950s and increased again in the 1960s cohort. Secondly, *Abitur* attainment rates among students whose parents are not *Abitur*-holders were lower in the GDR than in the FRG and did not change among cohorts entering the secondary school track immediately before reunification. Again, we can observe that changes in the GDR's IEO are principally due to shifting rates among students with more highly educated parents. Thirdly, *Abitur* attainment rates for students who do not have *Abitur*-holding parents increased in the FRG for the 1960s and 1970s cohorts. As with the GLHS data, the gap in IEO between the FRG and the GDR was the largest for cohorts born in the 1950s until mid-1960s and smallest for cohorts entering the secondary school track just before reunification.

Hence, both GLHS and GGSS data identify similar levels of IEO in the FRG and the GDR for birth cohorts segregated into the secondary school track right before reunification. However, in both surveys, individuals provide their information on the *Abitur* attainment retrospectively (e.g. aged 22 to 40 in the GGSS data). Individuals may, therefore, have attained their *Abitur* not during their secondary education but later in life. This could be problematic as some of the last cohorts entered secondary education under the GDR but may

have achieved their *Abitur* post-reunification. Delayed *Abitur* attainment is, of course, also possible for individuals from West Germany but improving opportunities in East Germany may have made it especially attractive to return to school for East German residents and particularly for those with *Abitur*-holding parents.

To limit incidences of delayed *Abitur* attainment, Figure A1 shows the results when restricting the sample to individuals aged 30 or under at the time of the interview. Due to this age restriction, the oldest cohorts 1951-1958 were dropped in this analysis. While the development of IEO in the GDR is mostly consistent with the picture we have seen in Figure 5, there are more fluctuations in IEO within the FRG. The more significant gap in IEO between the FRG and the GDR in Figure A1 compared to Figure 5 can be attributed to a higher risk difference in the FRG when restricting the sample to age 30 at the time of the interview. Hence, our additional analysis suggests any evidence that initial results are driven by delayed *Abitur* attainment after reunification is weak. Although this possibility cannot be ruled out, we can be quite confident that IEO had increased in the pre-reunification cohort and became increasingly similar to the FRG level when compared to previous birth cohorts. However, the level of IEO consistently remained below the level of the FRG.

Figure 5 here

Figure 5 also illustrates changes in *Abitur* rates for both educational groups after reunification. In the GSS data, we differentiated birth cohorts 1975-1981, aged 10-16 in the school year 1991/1992 and who transitioned into the secondary school track immediately after reunification reforms took place, and birth cohorts 1982-1990, who faced the prospect of upper secondary schooling when these reforms were more established. All East German students of the 1975-81 birth cohorts increased their attainment rates post-reunification, but the increase was more pronounced for those whose parents were not *Abitur*-holders. As a consequence, and contrary to expectations, IEO declined across all of Germany post-

reunification in the GGSS data (see upper right-hand graph). For the later birth cohort of 1982-1990, who entered the secondary track when reforms were more established, both groups continued to increase their attainment rates; however, for this cohort, the increase was slightly stronger among individuals whose parents were *Abitur*-holders. To summarize, according to the GGSS data, the level of IEO did not increase post-reunification. In fact, it was lower than for those cohorts who completed school before reunification. Across the West German birth cohort born from 1975-81 *Abitur* attainment increased, but this was more modest among children whose parents were not *Abitur*-holders. For birth cohort 1982-90, however, we see opposing developments, while individuals whose parents are not *Abitur*-holders continued to be more likely to gain the *Abitur*, individuals with highly educated parents showed a decline in attainment rates. The upper right-hand graph shows that the levels of IEO between East and West Germany converged again, but this time at a lower level. This convergence was due to declining IEO in West Germany.

Figure 6 here

Based on GMC data, Figure 6 shows the development of social inequalities in attending the *Gymnasium* shortly before (birth cohort 1973) and after reunification. The 1975-1978 birth cohorts transitioned into the secondary school track in 1991/1992 during the reformation of the educational system in the GDR, at which point the age of tracking shifted from 16 years-of-age to 10 or 12 years-of-age. Birth cohorts of either 1979 or 1981, depending on their state's lowering of tracking age to 10 or 12 years-of-age (see: Table 1), were immediately confronted with the process of either decision or selection into secondary school tracks on the introduction of these reforms. The birth cohorts 1982-1985 had started elementary school under the GDR and were segregated into secondary schooling after reunification. The birth cohorts 1986-1992 were the first to begin elementary school after reunification.

In the GMC data, the difference in IEO between the FRG and the GDR pre-reunification is more pronounced than in the GLHS and GGSS data. For the pre-reunification cohort, the difference in risk differences between both states is around 15 percentage points. As found in the GGSS data, there was an increase among all students who entered the *Abitur* track post-reunification, independent of parental educational achievement. For the birth cohort 1975, 16 at the time of segregation into secondary school tracks, we see a stronger increase in *Gymnasium* attendance among students with *Abitur*-holding parents than those without. However, this is not the case for 1977 and 1978's birth cohorts, when *Gymnasium* attendance rose for both groups. It appears that 16-year-olds who do not have *Abitur*-holding parents were less inclined to take advantage of the new opportunities reunification provided as their peers with more highly educated parents. While *Gymnasium* attendance for individuals in East Germany without *Abitur*-holding parents caught up with *Gymnasium* attendance for those in the West with the same background, there is still a notable gap in *Gymnasium* attendance for individuals with *Abitur*-holding parents between East and West. Accordingly, IEO is still smaller in the East compared to the West for these cohorts.

There was a more significant increase of East German students whose parents are *Abitur*-holders from the 1979-1981 birth cohorts, segregated during the 1991/92 school year at 10 or 12 years-of-age, attending the *Gymnasium* than those whose parents are not *Abitur*-holders. As a result, we see an increase in IEO. During the same period, IEO in West Germany had been decreasing due to a declining percentage of students with *Abitur*-holding parents attending the *Gymnasium*. As a consequence of these divergent developments, the level of IEO has been quite similar for these cohorts.

Students of the 1982-1985 birth cohorts whose parents are *Abitur*-holders decreased in their *Gymnasium* attendance rate (compared to those of earlier years) to a stronger extent than individuals whose parents are not. Hence, we identified a decline in IEO in East

Germany compared to previous cohorts. However, the level of IEO in East Germany is still slightly higher than it was pre-reunification.

For the 1986-1992 birth cohorts who spent their entire educational career in the unified Germany the level of IEO increased again, particularly for the last cohorts in our observation period. The level of IEO is even higher in East than in West Germany for the 1992 birth cohort, as there was a more significant rise in *Gymnasium* participation among students with *Abitur*-holding parents than students whose parents are not. For these cohorts, the rate of *Gymnasium* attendance for students with *Abitur*-holding parents became comparable across Germany. Overall, it is striking how similar *Gymnasium* attendance rates for individuals with the same parental background have become in both states post-reunification.

Figure 7 here

In Figure 7, we compared the development of IEO in different East German federal states after reunification with the overall average of the West German states. Due to variations in the adoption of West German education system characteristics, we expected IEO to increase the most in Mecklenburg-Vorpommern, less so in Brandenburg and Sachsen-Anhalt and to the lowest extent in Sachsen and Thüringen.

Mecklenburg-Vorpommern appears to be an outlier in having had an exceptionally high level of IEO pre-reunification (risk difference of more than 65%) even compared to the West German average. Post-reunification, the level of IEO in Mecklenburg-Vorpommern declined and converged to the West German level. As expected, IEO had been much lower for all other states in the GDR, especially for Brandenburg and Sachsen-Anhalt. We found an immediate increase in the level of IEO for all birth cohorts affected by reunification reform changes in Brandenburg and Sachsen-Anhalt. The level of IEO also increased post-reunification in Sachsen and Thüringen and merged to the West German level. However, this

increase was most pronounced for individuals who spent their entire educational career in the unified and reformed German system (birth cohort 1986-1992). Hence, reforms seem to have had a prolonged impact on social inequality in these states.

DISCUSSION AND CONCLUSIONS

In this paper, we aimed to provide a detailed account of differences and changes in IEO in East and West Germany across reunification, thereby shedding light on the role of macro-level economic, cultural and institutional characteristics in shaping social inequalities in educational attainment.

The empirical analyses provided support for our first hypothesis: social inequalities in educational attainment were weaker in the GDR than in the FRG. We also found that IEO varied across periods in the GDR. While social inequalities have been lower in the GDR than in the FRG in each cohort, they were substantially weaker for cohorts born between the 1950s and mid-1960s, i.e. individuals entering the secondary school track in the 1960s and 1970s. For cohorts born from the mid-1960s onwards, IEO increased in the GDR and became similar to the level of IEO in the FRG in both the GLHS and GGSS data pre-reunification. The GMC data, however, still showed a substantial gap between IEO in the GDR and the FRG immediately before reunification. Taking all three data sources into account, we conclude that IEO became larger across the existence of GDR but remained weaker than in the FRG before reunification.

By looking at the development of *Abitur* rates for children of parents who are, and are not, *Abitur*-holders separately, we gained important insights into why IEO varied between the GDR and the FRG. Contrary to the GDR's policy aims, *Abitur* attainment rates have been relatively similar among students who do not have *Abitur*-holding parents in both parts of Germany for cohorts born in the 1930s and 1940s. For subsequent cohorts, the probability of attaining the *Abitur* when your parents had not the *Abitur* was actually higher in the FRG than

in the GDR. It was the percentage of students attaining the *Abitur* whose parents had also done so that strongly varied across the two political and educational settings before reunification. These individuals had a higher probability of achieving the *Abitur* in the FRG than in the GDR. These results may indicate that GDR policies restrained students from exploiting their family resources or checked family aspirations, rather than indicating policies to promote working-class students were effective.

After reunification, IEO became increasingly similar in East and West Germany. This convergence can be attributed to both increasing inequalities in East Germany and declining inequalities in West Germany, in particular for birth cohorts transitioning into the secondary school track immediately preceding reunification. The level of IEO in East Germany after reunification fluctuates across cohorts born in the 1980s but is remarkably similar to the West German level. For cohorts born at the beginning of the 1990s, we see a sharp increase in the level of IEO in East Germany which is even more pronounced than West German levels. This increase in the level of IEO in East Germany can be attributed to a more significant rise of students with *Abitur*-holding parents attending *Gymnasium* when compared to students whose parents are not.

It appears that highly educated families reacted to improved opportunities and made use of their resources, in a way potentially impossible for other families. Nevertheless, for children of both those with and without the *Abitur* participation rates in *Gymnasium* became remarkably similar in East and West Germany post-reunification. Notably, there has been a considerable increase in *Gymnasium* participation in East Germany among students whose parents are not *Abitur*-holders since reunification. While IEO in East Germany increased, the outlook for students who do not have *Abitur*-holding parents improved as the likelihood of attaining the *Abitur* actually increased for both groups.

The finding of convergence between East and West Germany is more compatible with our systemic change hypothesis (2a) than with the economic shock hypothesis (2b) which assumed a sharp and immediate increase in IEO in East Germany to above the West German level. Aside from outlier Mecklenburg-Vorpommern, the state-level analysis provides further evidence of convergence. The prolonged duration of IEO equalization to West German levels in the states of Sachsen and Thüringen compared to Brandenburg and Sachsen-Anhalt may be attributed to the fact that teachers in Sachsen and Thüringen had the decision-making power over whether a student should attend *Gymnasium*, instead of parents. Nevertheless, in all states, students with *Abitur*-holding parents profited more substantially from these institutional changes than students whose parents are not. However, this does not exclude the possibility that the economic recession after reunification contributed to an increasing level of IEO. We did not find any evidence for the socialization hypothesis (2c) which argues IEO attainment in East Germany should have remained weaker than in West Germany after reunification. The increasing level of IEO in the GDR immediately before reunification indicates that the socialist values propagated in their education system had no discernable effect on IEO within either a socialist or a free-market system.

This study makes important contributions to research on IEO by investigating the role of institutional, socio-political and economic changes in shaping socially stratified educational pathways. Firstly, we showed that a socialist system such as the GDR did indeed have lower levels of IEO than a free-market economy. However, it was not able to fully eradicate IEO through policies explicitly aimed to support working-class children and an institutional system incorporating low and late tracking. That the political and institutional setting of the GDR did not promote higher levels of *Abitur* attainment among students whose parents are not *Abitur*-holders, is a striking result of our analysis. Instead, the GDR's lower level of IEO was achieved by suppressing the number of students from highly educated

backgrounds who would, without the restrictions created by the political system, have exploited family resources. This policy achieves lower overall *Abitur* rates compared to a free-market system. Also, children with lower educated parents had a higher probability of attaining the *Abitur* in the FRG compared to the GDR for cohorts born from the 1950s onwards.

Secondly, our results showed that IEO in East Germany increased after reunification. We attribute this to institutional changes in the educational system. This result is in line with research on other transition states that consistently finds increasing social inequalities post-transition (Beblo and Lauer 2004; Bukodi and Goldthorpe 2010; Gerber 2000; Hazans et al. 2008; Hertz et al. 2009; Mateju et al. 2003; Varga 2006). Students with highly educated parents benefited disproportionately from the expansion of secondary education, and the changes in the educational decision-making process and tracking age, when compared to students with less educated parents. Our results, therefore, suggest that educational reforms which are concerned with the extent and timing of tracking, and parental freedom of educational decision-making, are consequential for the level of IEO in modern societies.

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ENDNOTES

¹ The percentage of students attending *Gesamtschulen* is small but slightly increased over time (Becker 2009: 90).

² To make the selection procedure more inclusive, the SED extended the definition of ‘worker’ so that it included nearly everyone.

³ Around 95 per cent of the 18-year olds live together with their parents.

⁴ A small proportion of pupils already attained the *Abitur* at the age of 18

⁵ Information on technically oriented *Gymnasien* is only included since GMC 2003.

TABLES AND FIGURES

TABLE 1

INSTITUTIONAL CHANGES (UNTIL 2004) AND PREDICTED DEVELOPMENT OF SOCIAL INEQUALITY IN EDUCATIONAL OPPORTUNITY

| Federal state | Tracking degree | Timing of tracking | Tracking decision procedure |
|------------------------|-----------------|--------------------|-----------------------------|
| Berlin (East) | ++ | + | ++ |
| Brandenburg | ++ | + | ++ |
| Mecklenburg-Vorpommern | ++ | ++ | ++ |
| Sachsen | + | ++ | + |
| Sachsen-Anhalt | + | (++) | ++ |
| Thüringen | + | ++ | + |

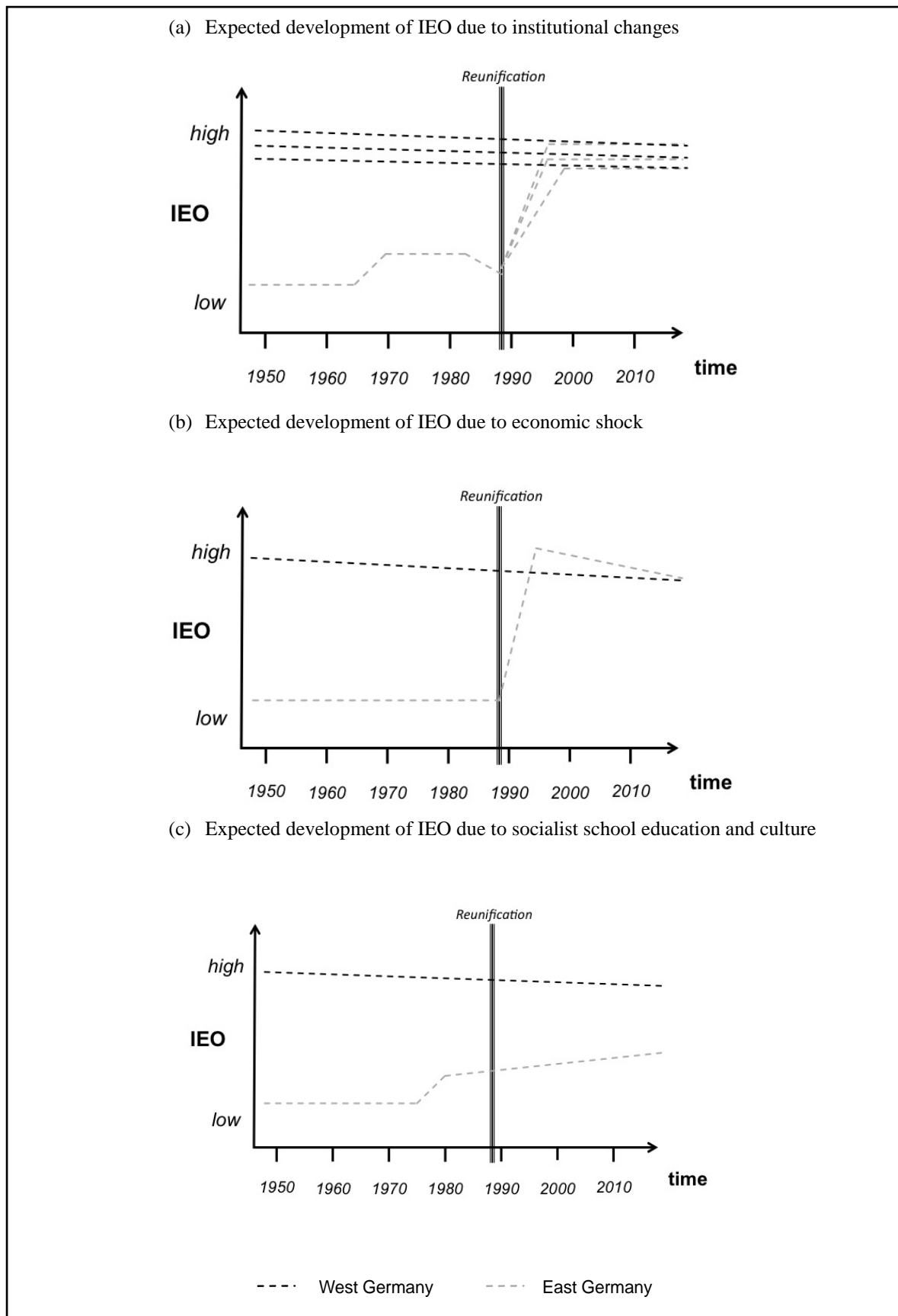


FIG. 1.—Changes in IEO predicted by *systemic change hypothesis* (H2a), *economic shock hypothesis* (H2b), and *socialization hypothesis* (H2c) in West Germany (dark grey dashed line) and in East Germany (light grey dashed line). In Fig. 1a) multiple lines indicate differences between federal states.

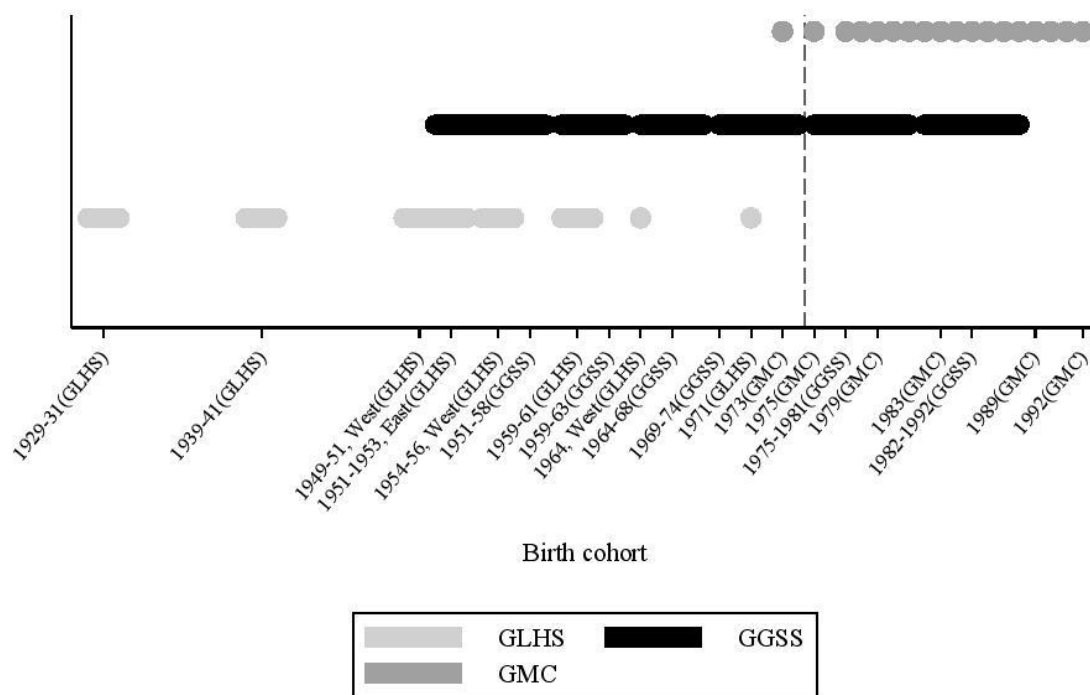


Fig. 2.—Classification of birth cohorts across different surveys

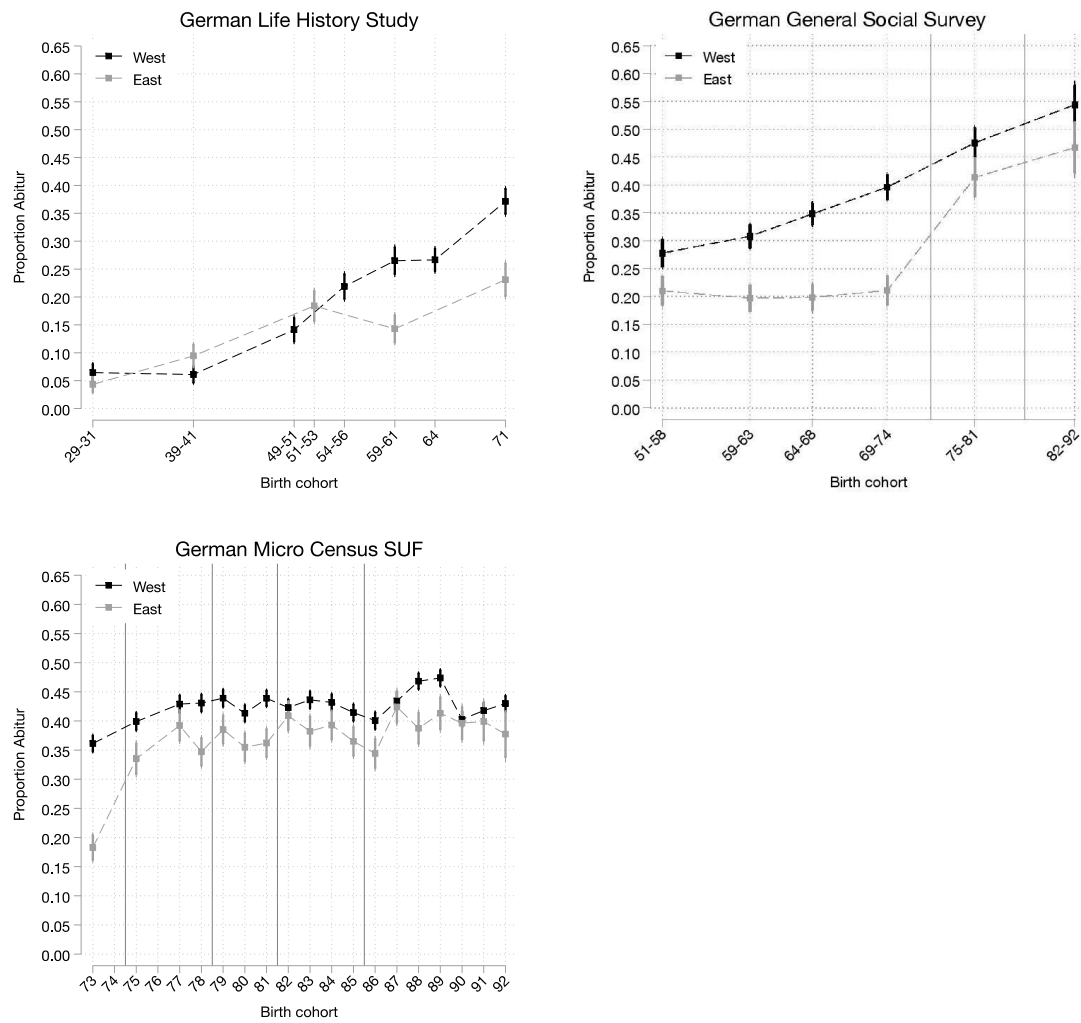


FIG. 3.—Change in percentage of Abitur attainment across birth cohorts in East and West Germany. First vertical line indicates the timing of reunification. Subsequent vertical lines differentiate birth cohorts according to the timing of educational transitions after reunification.

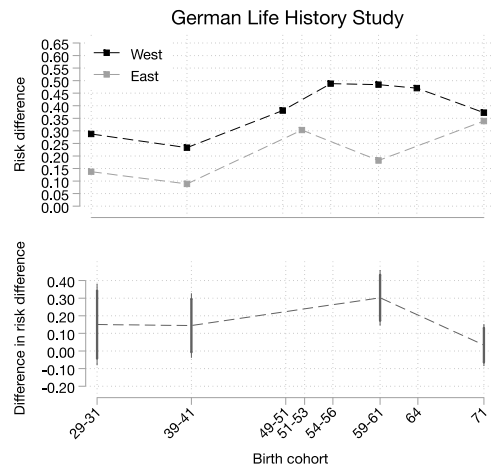
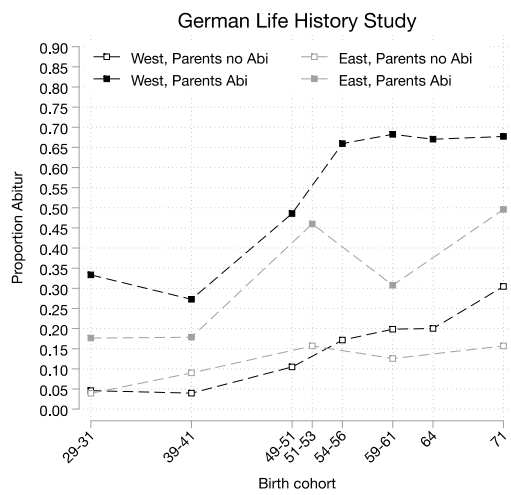


FIG. 4.—Change in IEO across birth cohorts in East and West Germany before reunification. Risk differences pertain to parental education. Difference in risk difference pertains to East and West Germany.

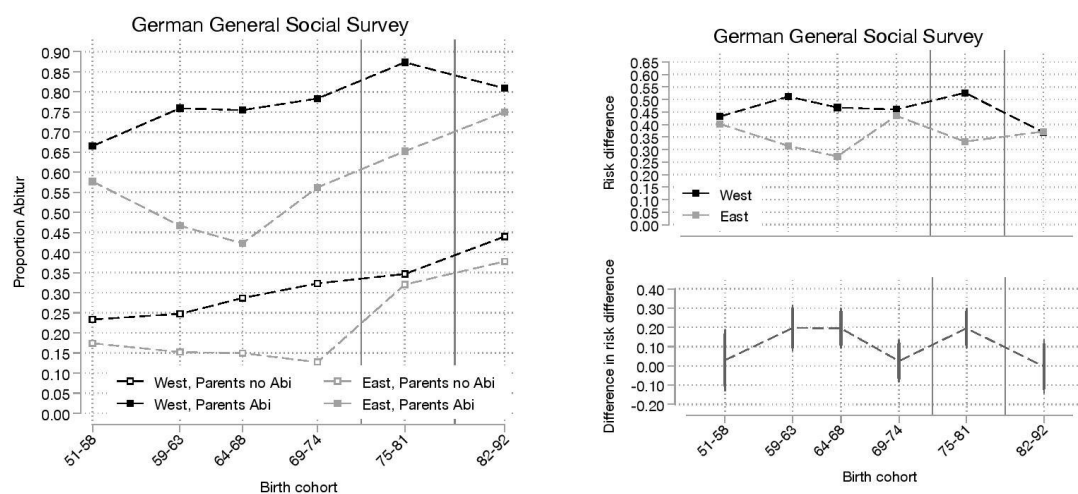


FIG. 5.—Change in IEO across birth cohorts in East and West Germany before and after reunification. Risk differences pertain to parental education. Difference in risk difference pertains to East and West Germany. First vertical line indicates the timing of reunification. Subsequent vertical lines differentiate birth cohorts according to the timing of educational transitions after reunification.

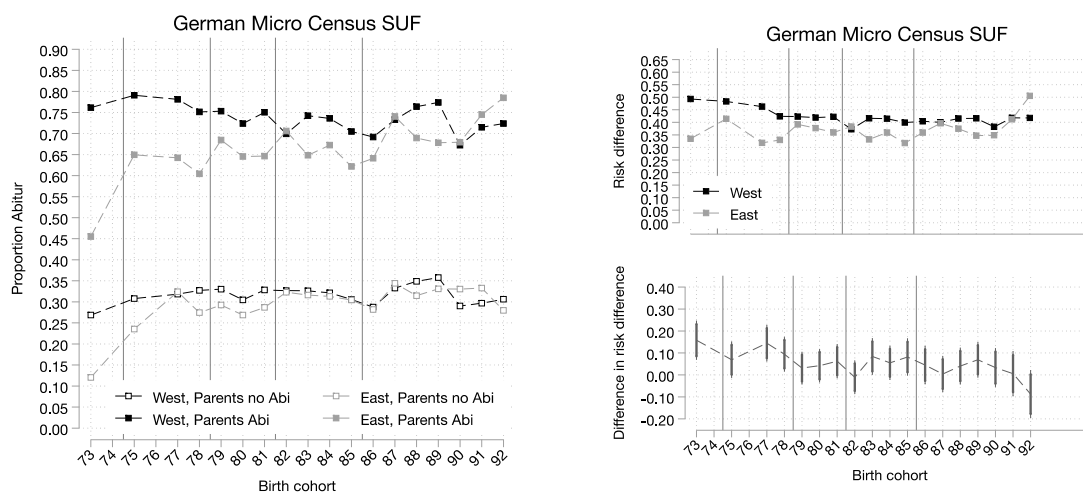


FIG. 6.—Change in IEO across birth cohorts in East and West Germany after reunification. Risk differences pertain to parental education. Difference in risk difference pertains to East and West Germany. First vertical line indicates the timing of reunification. Subsequent vertical lines differentiate birth cohorts according to the timing of educational transitions after reunification.

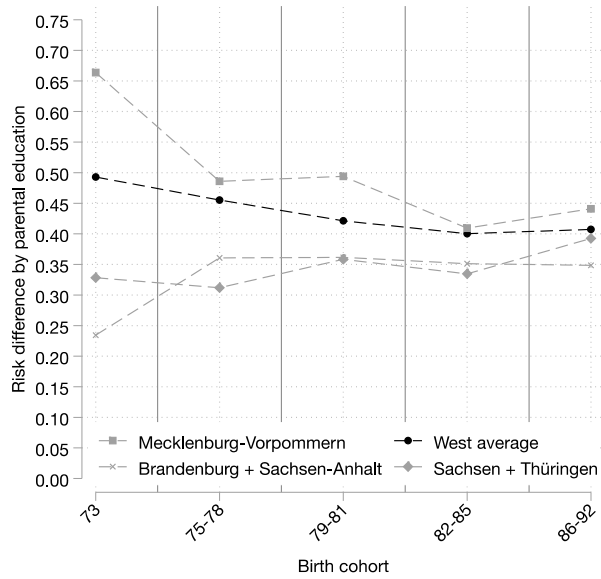


FIG. 7.—Change in IEO across birth cohorts in East German federal states and West German average. Risk differences pertain to parental education. First vertical line indicates the timing of reunification. Subsequent vertical lines differentiate birth cohorts according to the timing of educational transitions after reunification.

APPENDIX

TABLE A1

CHARACTERISTICS OF EDUCATIONAL INSTITUTIONS IN WEST GERMAN FEDERAL STATES,
SCHOOL YEARS 1949/50 TO 2003/04

| Federal state | Tracking degree (1991/92-2003/04) | Timing of tracking (1949/50-2003/04) | Decision procedure for access to Gymnasium (1949/50-2003/04) |
|-------------------------|---|--|---|
| Baden- Württemberg | High | From 1952/53 age 10 | Until 1966/67 exam; 1967/68- 1978/79 teachers decide and parents can ask for exam; from 1979/80 teachers decide |
| Bayern | High | Age 10 | Until 1960/61 exam; 1961/62- 1970/71 teachers decide and parents can ask for exam; from 1971 teachers decide |
| Berlin (West) | High | From 1952/53 Age 12 | 1952/53-1954/55 teachers decide; since 1955/56 parents decide |
| Bremen | High | 1950/51-1956/57 age 12; 1957/58 to 1976/77 age 10; since 1977 age 12 | Until 1956/57 exam; 1957/58- 1976/77 teachers decide; from 1977/78 parents decide |
| Hamburg | High | Until 1953/54 age 12; from 1954/55 age 10 | Until 1967/68 exam; from 1978/79 parents decide |
| Hessen | High | Age 10 | Until 1959/60 exam; 1960/61- 1993/94 teachers decide; since 1994/95 parents decide |
| Niedersachsen | High | Age 10 until 1970/71; until 2003/04 age 12 from 1971/72 | Until 1963/64 exam; 1964/65- 1977/78 teachers decide; since 1978/79 parents decide |
| Nordrhein- Westfalen | High | Age 10 | No information until 1962/63; from 1962/63-1963/64 teachers decide and parents can ask for exam; 1964/65-1996/97 parents decide; since 1997/98 teachers decide |
| Rheinland-Pfalz | High | From 1956/57 age 10 | Until 1959/60 teachers decide and parents can ask for exam; 1961/62 to 1965/66 teachers decide; 1967/68-1983/84 teachers decide; since 1984/85 parents decide |
| Saarland | High until 1996/97, lower from 1997/98 | Age 10 | No information until 1974/75; 1975/76 to 1987/88 teachers decide; 1988/89 to 1999/2000 parents decide; since 2000/01 teachers decide |
| Schleswig- Holstein | High | Age 12 until 1950/51; age 10 from 1951 | Until 1970/71 exam; since 1972/73 parents decide |

NOTE.—Based on Helbig and Nikolai (2015).

TABLE A2

CHARACTERISTICS OF EDUCATIONAL INSTITUTIONS IN EAST GERMANY BEFORE AND AFTER REUNIFICATION

| Federal state | Tracking degree (1991/92-2003/04) | Timing of tracking (1949/50-2003/04) | Decision procedure for access to Gymnasium (1949/50-2003/04) |
|------------------------|--------------------------------------|--|---|
| Before reunification: | Low | Age 14 until 1983; then age 16 | School decides on the basis of strict inequality reducing policies; from 1965 the regulations are slightly softened |
| After reunification: | | | |
| Berlin (East) | High | Age 12 | Parents decide |
| Brandenburg | High | Age 12 | Parents decide |
| Mecklenburg-Vorpommern | High | Age 10 | Parents decide |
| Sachsen | Lower | Age 10 | Teachers decide |
| Sachsen-Anhalt | Lower | Age 10 until 1996/97; 1997/98-2002/03 age 12; from 2003/04 age 10 | Parents decide |
| Thüringen | Lower | Age 10 | Teachers decide |

NOTE.—Based on Helbig and Nikolai (2015).

TABLE A3

NUMBER OF CASES IN GERMAN LIFE HISTORY STUDY, BY BIRTH COHORT, REGION,
AND PARENTAL EDUCATION

| Birth cohort | East Germany | | West Germany | |
|--------------|----------------|-------------|----------------|-------------|
| | Parents no Abi | Parents Abi | Parents no Abi | Parents Abi |
| 29-31 | 561 | 17 | 654 | 45 |
| 39-41 | 534 | 28 | 656 | 66 |
| 49-51 | | | 659 | 70 |
| 51-53 | 510 | 50 | | |
| 54-56 | | | 846 | 91 |
| 59-61 | 501 | 52 | 791 | 126 |
| 64 | | | 1,109 | 182 |
| 71 | 440 | 123 | 1,018 | 223 |

TABLE A4

NUMBER OF CASES IN GERMAN GENERAL SOCIAL SURVEY, BY BIRTH COHORT, REGION,
AND PARENTAL EDUCATION

| Birth cohort | East Germany | | West Germany | |
|--------------|----------------|-------------|----------------|-------------|
| | Parents no Abi | Parents Abi | Parents no Abi | Parents Abi |
| 51-58 | 640 | 66 | 851 | 106 |
| 59-63 | 697 | 118 | 1,251 | 173 |
| 64-68 | 709 | 154 | 1,517 | 240 |
| 69-74 | 566 | 135 | 1,175 | 222 |
| 75-81 | 492 | 183 | 831 | 279 |
| 82-92 | 338 | 110 | 571 | 238 |

TABLE A5

NUMBER OF CASES IN GERMAN MICROCENSUS, BY BIRTH COHORT, REGION,
AND PARENTAL EDUCATION

| Birth cohort | East Germany | | West Germany | |
|--------------|----------------|-------------|----------------|-------------|
| | Parents no Abi | Parents Abi | Parents no Abi | Parents Abi |
| 73 | 731 | 167 | 2,733 | 633 |
| 75 | 663 | 211 | 2,522 | 588 |
| 77 | 747 | 204 | 2,384 | 749 |
| 78 | 849 | 240 | 2,390 | 772 |
| 79 | 848 | 263 | 2,393 | 830 |
| 80 | 845 | 251 | 2,547 | 890 |
| 81 | 865 | 229 | 2,696 | 957 |
| 82 | 821 | 238 | 2,556 | 891 |
| 83 | 800 | 199 | 2,440 | 877 |
| 84 | 821 | 235 | 2,495 | 905 |
| 85 | 815 | 193 | 2,412 | 904 |
| 86 | 809 | 170 | 2,369 | 921 |
| 87 | 715 | 181 | 2,474 | 842 |
| 88 | 734 | 177 | 2,649 | 1,071 |
| 89 | 668 | 208 | 2,695 | 1,043 |
| 90 | 684 | 159 | 2,588 | 1,080 |
| 91 | 511 | 98 | 2,756 | 1,122 |
| 92 | 329 | 79 | 2,597 | 1,093 |

TABLE A5

NUMBER OF CASES IN GERMAN MICROCENSUS, BY BIRTH COHORT, FEDERAL STATE, AND PARENTAL EDUCATION

| Birth cohort | West Germany | | Brandenburg + Sachsen-Anhalt | | Sachsen + Thüringen | | Mecklenburg-Vorpommern | |
|--------------|----------------|-------------|------------------------------|-------------|---------------------|-------------|------------------------|-------------|
| | Parents no Abi | Parents Abi | Parents no Abi | Parents Abi | Parents no Abi | Parents Abi | Parents no Abi | Parents Abi |
| 73 | 2,733 | 633 | 258 | 69 | 363 | 76 | 110 | 22 |
| 75-78 | 7,296 | 2,109 | 848 | 227 | 1,098 | 348 | 313 | 80 |
| 79-81 | 7,636 | 2,677 | 979 | 269 | 1,215 | 397 | 364 | 77 |
| 82-85 | 9,903 | 3,577 | 1,245 | 325 | 1,556 | 449 | 456 | 91 |
| 86-92 | 18,128 | 7,172 | 1,719 | 404 | 2,192 | 575 | 539 | 93 |

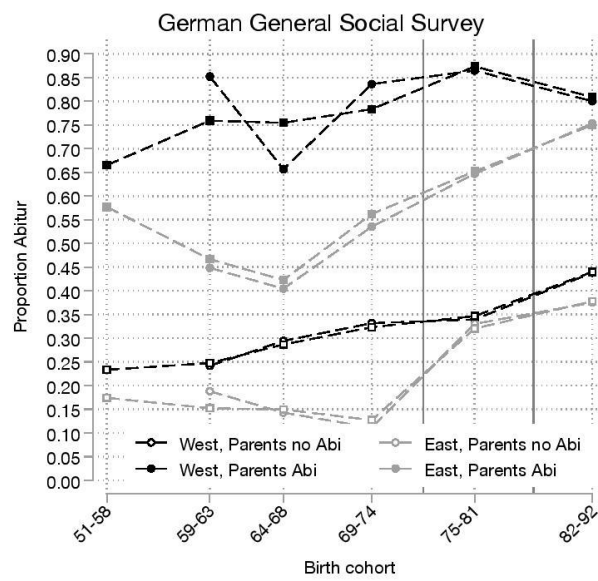


FIG. A1.—Comparison of estimates from full sample and sample restricted to respondents aged 30 years or younger